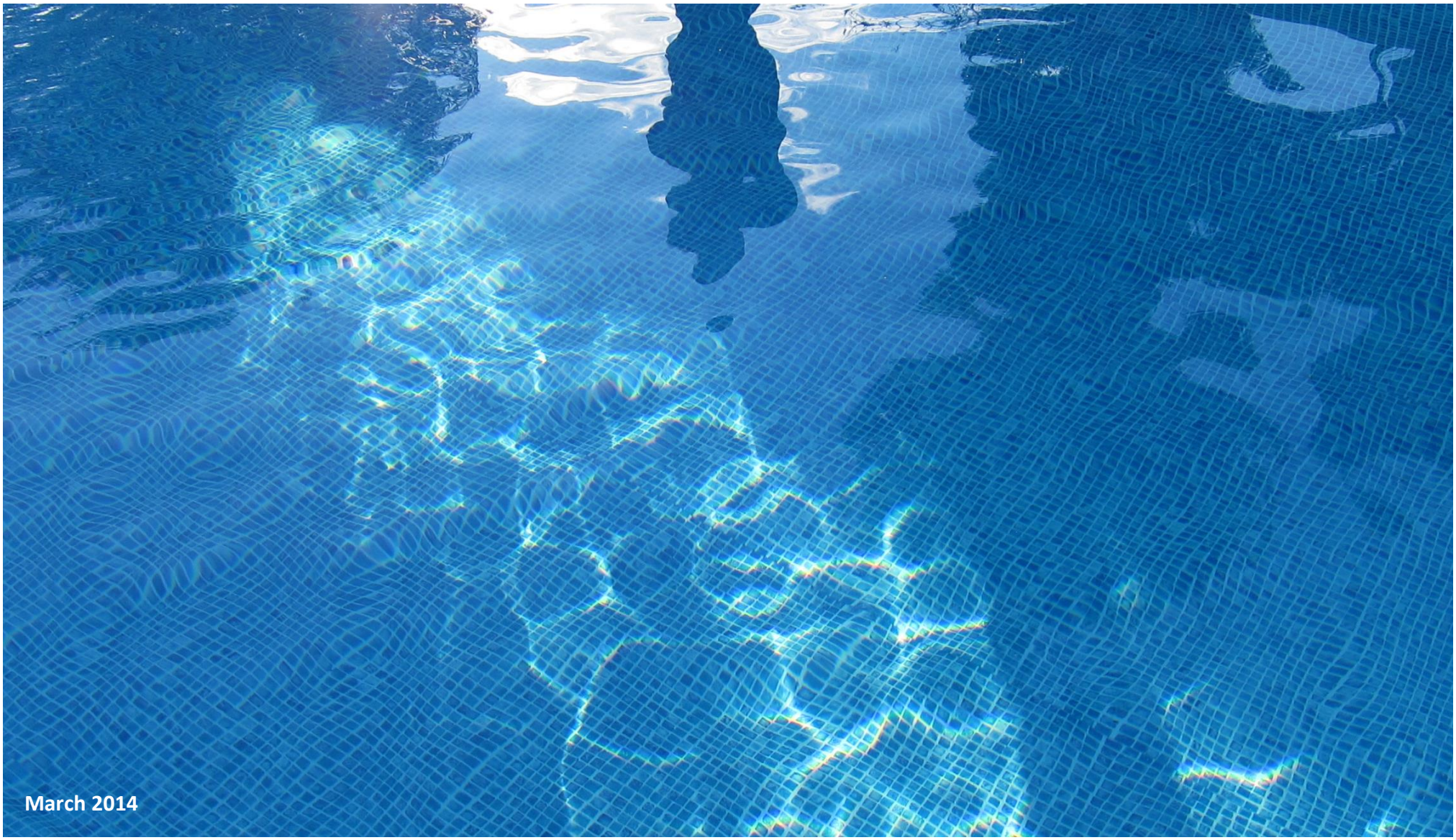

Drowning in Kansas

Injury Prevention and Disability Program

Kansas
Department of Health and Environment

Drowning in Kansas

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Executive Summary

Water can be fun and restorative. In Kansas, the warmer days in the late spring and summer months bring people to water and water-related activities, which increases the risk for drowning. Young children, in particular, don't have the experience or maturity to be safe in or around water. Drowning can occur in any water source. In Kansas, this includes open bodies of water such as lakes, ponds, creeks, rivers or ditches, and in the home in bathtubs, pools and spas.

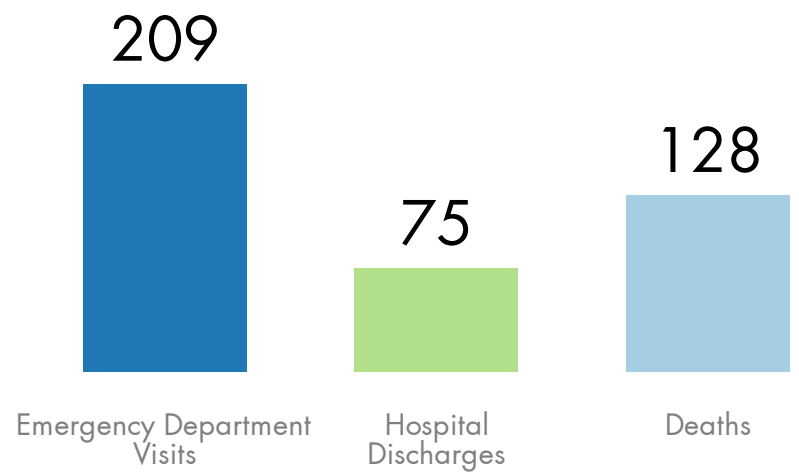
Drowning is a rare event and is considered an either/or event: drowning happens or it doesn't. It is likely that many people have been in a situation they would call a near drowning, they may have got tired swimming or got caught under a current. Many people do not go to the hospital or seek medical attention after a near drowning, which makes measuring drowning using medical records challenging.

In 2012, drowning was the third leading cause of injury death for Kansas children 14 years old and younger. Near drownings, those that result in emergency department visits and hospital discharges, are higher in males than females and higher among children compared to older age groups.

Risk factors for drowning include lack of swimming ability, lack of supervision, lack of physical barriers and alcohol use.[1] Through multiple layers of protection, drowning may be prevented. Active supervision, environmental strategies, proper equipment and education are critical to prevention.

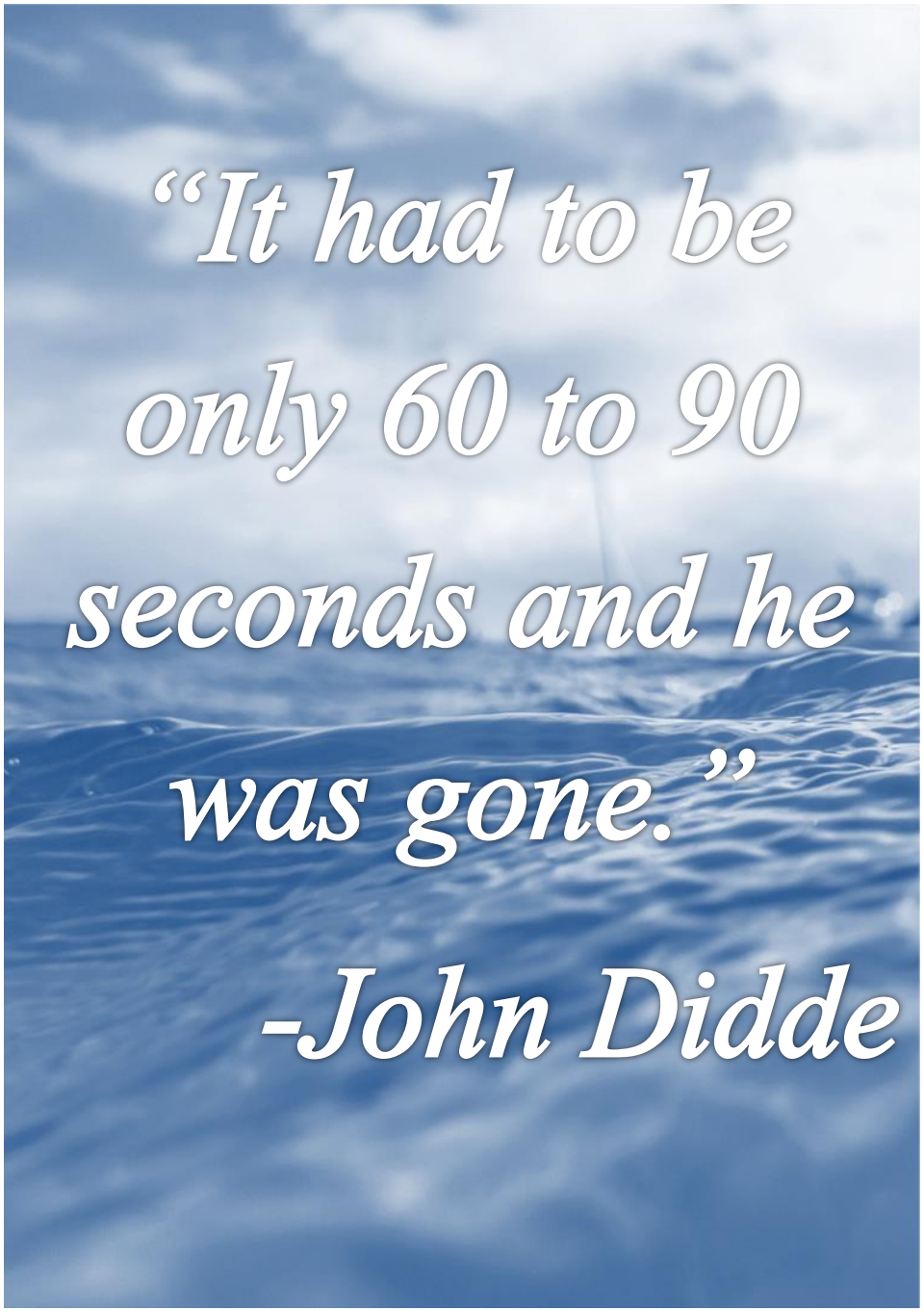
From 2007-2010, years in which there is Kansas data for all three databases (Emergency Department, Hospital Discharge and Vital Statistics), there were some deaths (n=128), fewer hospital discharges (HD; stays of 24 hours or more, n=75), and many emergency department visits (EDV; stays less than 24 hours, n=209). Because rates based on low counts can be unreliable, this report examines incidence counts more than rates.

Drowning related Events in KS, 2007-2010



Sources: 2007-2010 Kansas Emergency Department Database & Hospital Discharge Database, Kansas Hospital Association, 2007-2010 Kansas Vital Statistics

Years of data included in this report are not the same across databases. Due to low counts with hospital discharges and deaths, it was necessary to use 10 years of data (2002-2011) for basic analyses. Because there are so many emergency department visits this was not necessary for the Emergency Department Database and only four years were used (2007-2010). *All the drowning events in this report are unintentional. Other types of drowning (suicide, homicide and other intent) are not included.*



Lifeguards put CPR training to good use

By JoAnn Shum
June 19, 2013

Story reprinted with permission from The Marysville Advocate, original story available at www.marysvilleonline.net/articles/2013/06/26/news/doc51c1dd1b4ce8b973008569.txt

"Without the Manley girls, my son would definitely be dead," said John Didde, Topeka, who credited Liz and Allison Manley, Marysville, with saving his son's life Saturday at a Kansas City, Mo., swimming pool.

"I was very fortunate to have both of those girls there," he said. "Without them and their knowledge of CPR, our lives would have been changed forever. I owe my life to them."

The Didde family and Kate Manley and daughters, Liz, 18, and Allison, 15, were attending the Edward Jones summer regional conference at the Sheraton Hotel in downtown Kansas City over the weekend when the incident occurred at the hotel pool.

Both John Didde and Kate Manley are financial planners with the company.

The Manley daughters were in the hotel's hot tub near the pool when they noticed a lot of activity around a young child lying by the pool. The child's older sister, Mollie, 7, was in the hot tub and told the girls that the young boy, Myles, was her brother.

"I stood there," said Liz. "I was in shock."

"It's hard to even think about it," Allison said. "I looked up and saw all these guys looking down at the boy. I said 'Oh my god, Liz.'"

"I had this bad feeling in my stomach," Allison said. "My first instinct was should we help, and we decided we could help."

Allison jumped in the pool and swam to the other side where the child was, and Liz ran over to the child.

Liz knelt down by the boy's head, tilted it back to open his airway, and told Allison, "Go," which they learned in their training means to start CPR.

"He was unconscious and he was blue and his eyes were rolling back into his head," Liz said. "He was lifeless and making a gurgling sound."

Allison gave him two ventilations, then did the chest compressions, then two more breaths, then two more compressions and then he spit out a lot of water, according to Liz.

"Once the water came out and he was revived, he immediately started crying," she said. "Once he started crying, his dad picked him up and held him."

"It all happened so fast," Allison said. "As we were doing CPR, the thought going through my mind was 'Is it going to work or is it too late.' You just keep trying."

"It opened up so many peoples' eyes," Liz said. "It was a wake-up call. The need for CPR can really happen. It's fast, you have to react, because you don't have much time."

"I never thought I'd have to do it, let alone at our pool, but this happened on our vacation," Allison said. "After seeing him lifeless, just to see the life in him again was amazing."

Allison said she was in shock for about 30 minutes afterward.

"Even if we did everything we could, there were no guarantees that he would make it," she said. "I can't believe it worked."

"The timing was perfect, and we worked together," Liz said. "It's amazing how calm we stayed. Something just kicked in. We had each other, and we kept each other calm.

"We definitely have a deeper appreciation of life."

Allison said she can't imagine what it would be like to lose a child.

"I think every parent should have CPR training," she said. "I figured there would be more people that would have the training, but out of the 30 at the pool, my sister and I were the only ones. His father tried everything he could to help his son."

Didde said Myles was in the hot tub area with him and Mollie but went to the main pool "and I didn't know it."
"It had to be only 60 to 90 seconds and he was gone," he said.

Ryan Henningsen, another Edward Jones financial planner at the conference, found Myles in the pool and pulled him out.

"We were doing our best attempt to save him until the trained professionals (Liz and Allison) stepped in and took over," Didde said. "In another 30 or 60 seconds we would have lost him for good or he would have had permanent damage from loss of oxygen to the brain."

He "seemed fine with being in the water." –Allison Manley

Myles doesn't recall much about the incident, Didde said.

"He remembers going underwater and hearing the water. He is 43 inches tall and he was in the three-foot area. He may have slipped or swallowed water."

Didde said he appreciated everything the Manley girls did.

"We were so fortunate to have Allison and Liz arrive in the nick of time," he said. "Others will learn from the experience of the importance of being certified in CPR."

Everyone chipped in to help out as much as they could, Didde said.

"The paramedics brought up oxygen, people used their cell phones to call 911 and for other assistance and to call my wife, Jamie, who was shopping on the Plaza. Others took care of my daughter," he said. "The Manley girls

did the majority of work, and the paramedics did the monitoring and then we were swept off to the hospital."

Myles was kept overnight at Children's Mercy Hospital.

Didde said Myles took swimming lessons last summer, and his summer swim lessons started Monday.

"He had two days of lessons this week and is enjoying it," Didde said.

Allison said she saw Myles playing in the pool earlier in the afternoon and she said he "seemed fine with being in the water."

Myles was dismissed from the hospital at 8:15 a.m. Sunday and the family's plans for spending Sunday at Worlds of Fun went on as planned with the Didde family at the front gate of the amusement park at 10 a.m.

"Myles felt good and wanted to go to Worlds of Fun like we planned, so we went," Didde said.

"There has been an overwhelming amount of support and concern for Myles," he said. "Some of the Edward Jones executives came by to visit him in the hospital."

The story of the Manley girls saving Myles Didde's life was told at the Edward Jones banquet on Saturday night and there were tears in the eyes of many there.

Allison had CPR and lifeguard training in April at Beatrice YMCA. This is her first year as a lifeguard at the Marysville City Pool.

Liz, who received her training four years ago, was recertified in April at the Beatrice YMCA. This is her fourth year as lifeguard, and she said she has had some close calls with kids panicking because they can't touch or swim, but no drownings or serious injuries.

"Accidents happen so fast and everyone thinks it can't happen to them or they are invincible, but things happen," Liz said.

Liz and Allison recommend everyone to take CPR.

"There can be a life-or-death situation anywhere, not just in a pool," Allison said. "Sometimes you have only a few minutes or seconds to save a life."

Didde said he plans to set up CPR trainings through his office in Topeka. "I definitely encourage people to take that training," he said. "My wife has the training."

"I know Kate Manley through our Edward Jones summer meetings," Didde said. "I didn't know the girls too well, but I am sure glad we know them now."

Allison said one interesting fact they discovered was that Kate, Liz and Allison were at Myles Didde's baptism four years ago in Topeka.

"It was almost like it was destiny," Allison said. "We were shopping in Topeka and decided to go to Mass at Christ the King Catholic church before coming home. A baptism was going on during the Mass, and it was Myles."

Kate knew the family through their business affiliation.

"Mom and Dad are real proud of us," Allison said. "A lot of people get emotional when we tell the story."

The girls plan to share their experience with their fellow lifeguards at the Marysville City Pool. Pool manager Maria Seematter called the girls "angels" when they arrived at work this week.

Allison will be a sophomore this fall at Marysville High School, and Liz will be a freshman at Kansas State University.

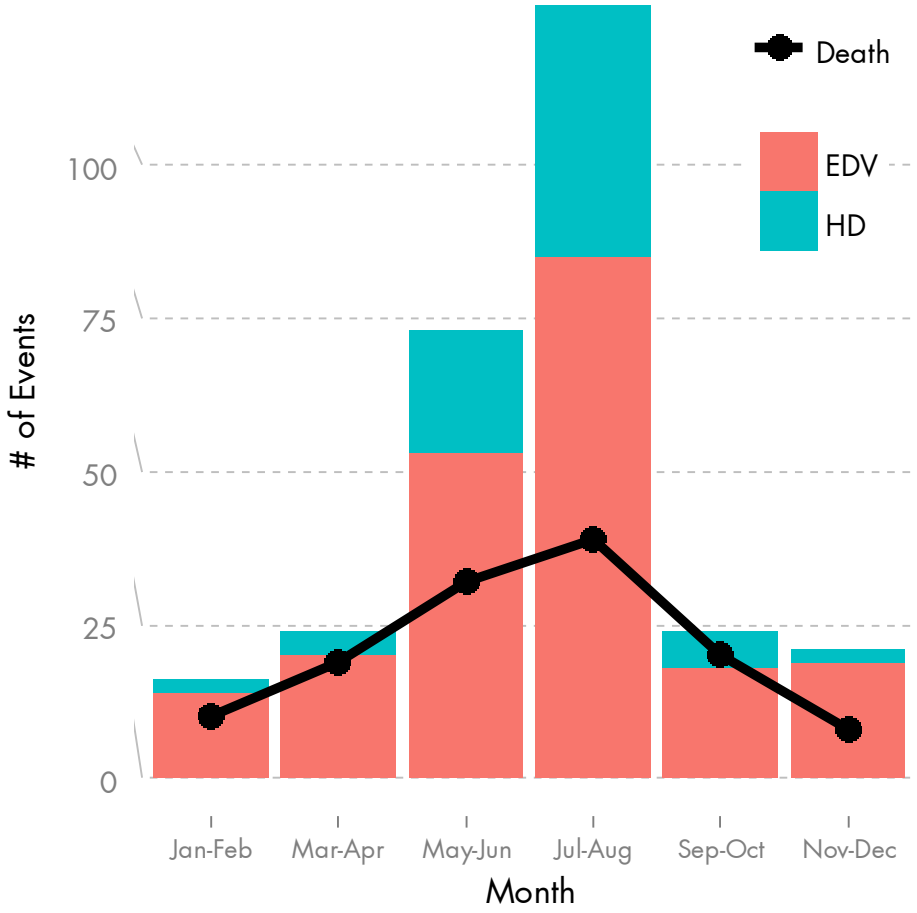
The Didde family sent the girls a bouquet of purple flowers on Monday.

Seasonality

Seasonality is very important when describing drowning injuries. During the summer months, more children and adults are in pools and lakes in Kansas. This exposure to water increases the risk of drowning injuries and deaths.

Drownings increased in the summer across all three databases for the 2007-2010 time period. The chart on the right shows the dramatic increase in drowning hospital discharges and emergency department visits during the summer months. There are more drowning injuries in the months of May to August than the rest of the year combined for both hospital discharges (81.3%) and emergency department visits (66.0%). Drowning deaths during the months of May to August made up 55.5 percent of all drowning deaths over the course of a year.

Kansas Seasonal Trends for Drowning Injuries
2007-2010

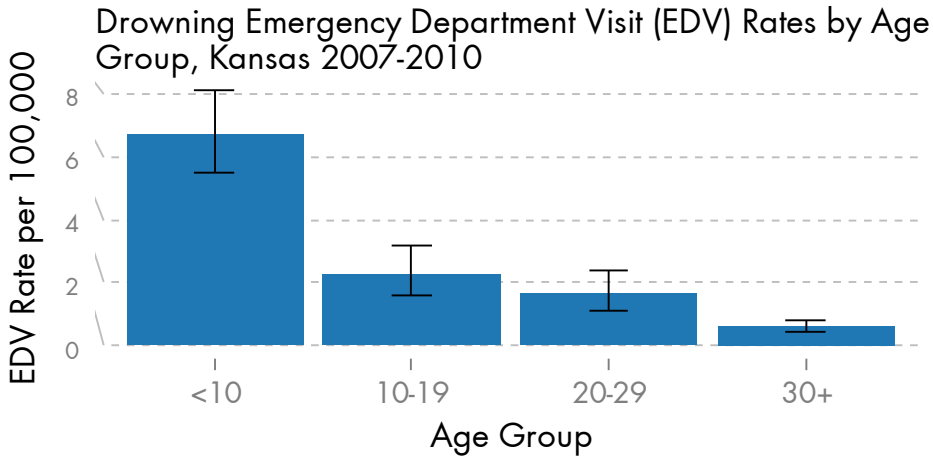


HD: Hospital Discharge, EDV: Emergency Department Visit
Sources: 2007-2010 Deaths, Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics. Kansas Hospital Discharge Database & Emergency Department Database, Kansas Hospital Association.

Emergency Department Visits

All differences stated in the following section are statistically significant. Please note that all confidence intervals for this section can be found in Table 1, page 7.

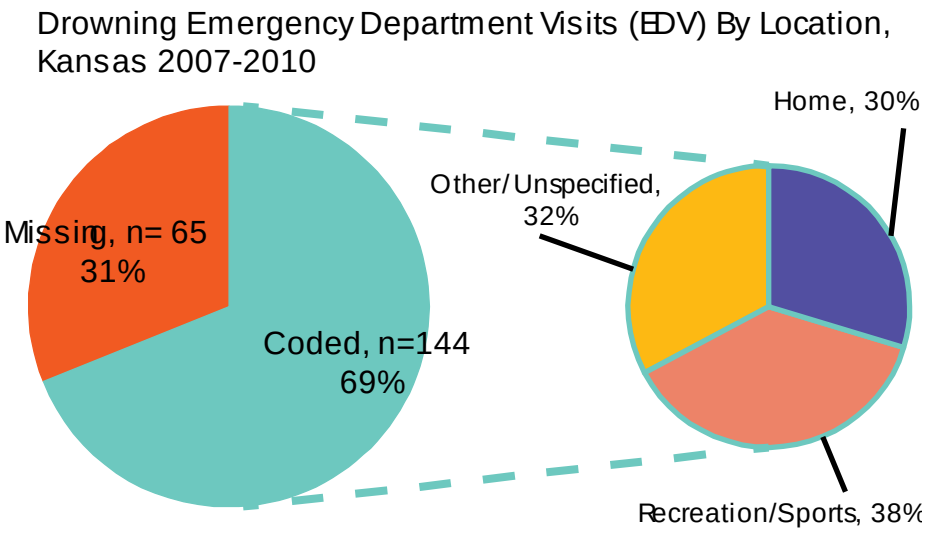
Drowning emergency department visits are more common among children than adults. The highest rate of drowning emergency department visits was seen among those less than 10 years old. The rate of drowning decreases dramatically as age increases. Those older than 30 years had the lowest rate of drowning emergency department visits (0.6 EDV per 100,000) as compared to all younger age groups. The majority of drowning emergency department visits were among males (64.1%).



Source: 2007-2010 Kansas Emergency Department Database, Kansas Hospital Association.

Location

Location coding can be used to describe where an injury occurs. Unfortunately, it is not widely used in Kansas hospitals. Of all injuries from 2007 to 2010, one third of injuries (36.7%) received no location coding, and similarly, nearly one third of unintentional drowning emergency department visits (31.1%) received no location coding.



Source: 2007-2010 Kansas Emergency Department Database, Kansas Hospital Association.

Among records with available location coding, more than 50 percent of drowning emergency department visits (n=97/144) occurred at either home or recreational/sports areas, (29.9% and 37.5%, respectively). Drowning prevention requires addressing risks in public and private settings. For more information on location coding, please see appendix.

Table 1. Drowning Emergency Department Visits (EDV) Kansas 2007-2010

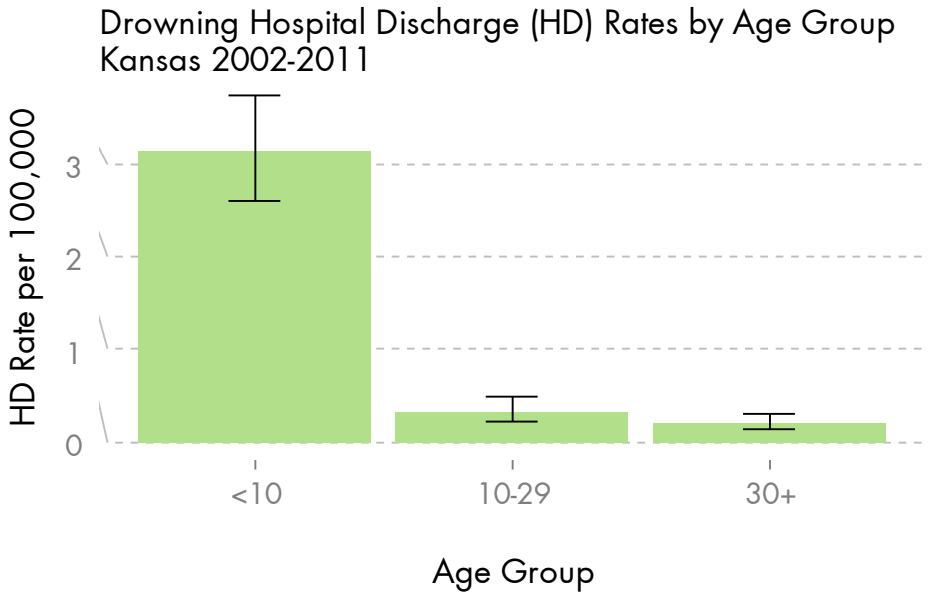
Demographic	#EDVs	EDV Rate (95% CI) *	% of Total
Overall	209	1.8 (1.6-2.1)	100.0%
Gender			
Female	75	1.3 (1.0-1.7)	35.9%
Male	134	2.3 (1.9-2.8)	64.1%
Age Group (Age-Specific)			
<10	107	6.7 (5.5-8.1)	51.2%
10-19	36	2.3 (1.6-3.2)	17.2%
20-29	27	1.7 (1.1-2.4)	12.9%
30+	39	0.6 (0.4-0.8)	18.7%

All rates are age-adjusted unless otherwise noted. *Drowning EDV Rate is per 100,000 population. Rates were age-adjusted to the 2000 U.S. Standard population using the direct method. See Technical Appendix for details on how rates were calculated. Source: 2007-2010 Kansas Emergency Department Database, Kansas Hospital Association.

Hospital Discharges

All differences stated in the following section are statistically significant. Please note that all confidence intervals for this section can be found in Table 2, right.

As with drowning emergency department visits (hospital stays less than 24 hours), as age increases the rate of drowning hospital discharges (stays greater than 24 hours) decreases. The drowning hospital discharge rate was highest among those younger than 10 years old, and was 10 times higher than those 30 years and older (3.1 vs. 0.2, respectively).



Source: 2002-2011 Kansas Hospital Discharge Database, Kansas Hospital Association.

Table 2. Drowning Hospital Discharges (HD) Kansas 2002-2011

Demographic	#HD	HD Rate (95% CI)*	% of Total
Overall	180	0.7 (0.6-0.8)	100.0%
Gender			
Female	66	0.5 (0.4-0.7)	36.7%
Male	114	0.9 (0.7-1.1)	63.3%
Age Group (Age Specific)			
<10	121	3.1 (2.6-3.7)	67.2%
10-29	26	0.3 (0.2-0.5)	14.5%
30+	33	0.2 (0.1-0.3)	18.3%

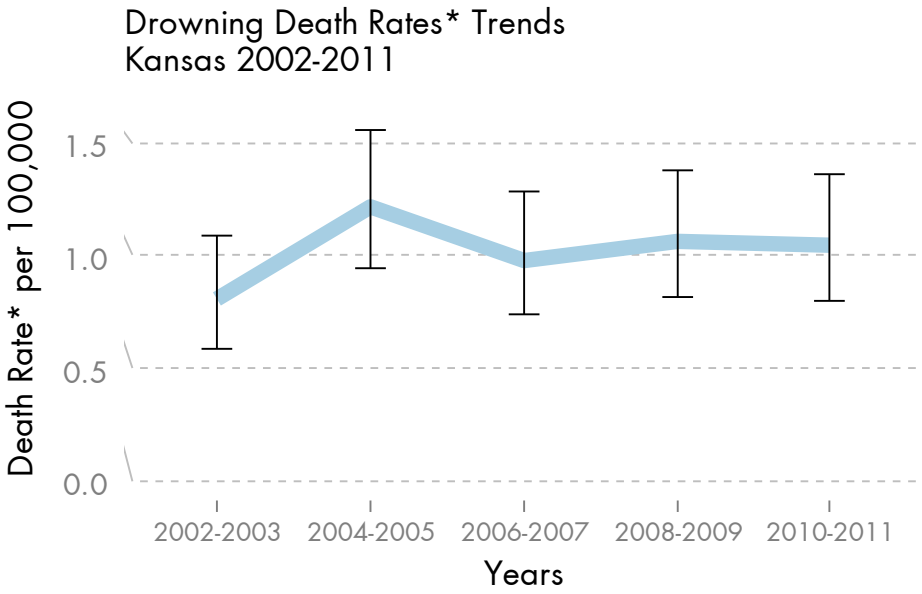
*All rates are age-adjusted unless otherwise noted. Drowning HD rate is per 100,000 population. Rates were age-adjusted to the 2000 U.S. Standard population using the direct method. See Technical Appendix for details on how rates were calculated. Source: 2002-2011 Kansas Hospital Discharge Database, Kansas Hospital Association.

Deaths

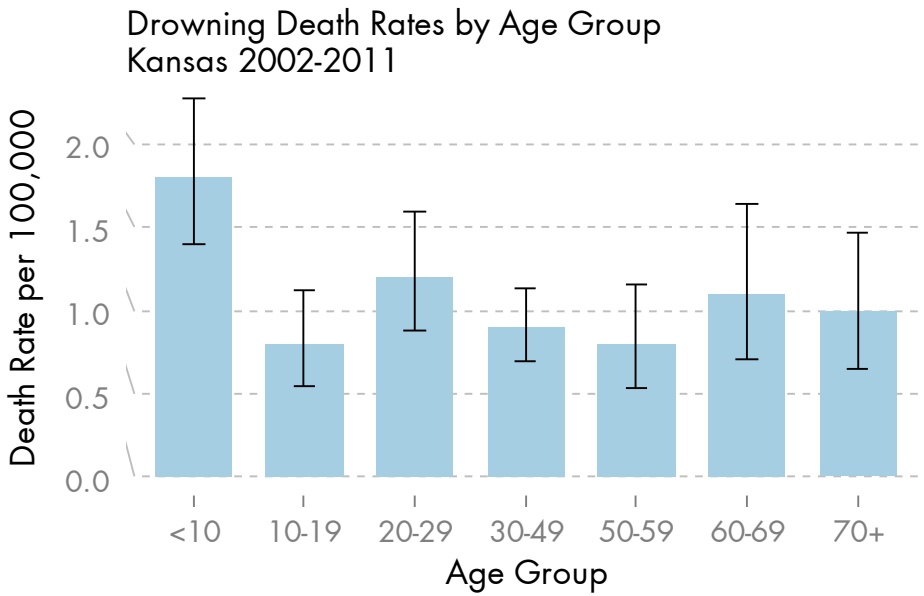
All differences stated in the following section are statistically significant. Please note that all confidence intervals for this section can be found in Table 3, page 10.

Looking at two year trends, drowning deaths rates have remained fairly consistent over the past decade with rates averaging close to 1 death per 100,000 population. From 2002 to 2011, males had a drowning death rate that was nearly 4 times higher than females, (1.9 vs. 0.5 per 100,000).

The rate of drowning death in those 10 years and younger was higher as compared to those 10-19 years old (1.8 vs. 0.8). The drowning death rate was fairly similar across adult age groups.



*Source: 2002-2011: Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics *Rates are age-adjusted to 2000 U.S. Standard population, see Appendix.*



Source: 2002-2011: Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics

Table 3. Drowning Mortality
Kansas 2002-2011

Demographic	#Deaths	Death Rate (95% CI)*	% of Total
Total	297	1.1 (0.9-1.2)	100.0%
Gender			
Female	63	0.5 (0.4-0.6)	21.2%
Male	234	1.9 (1.6-2.1)	78.8%
Age Group (Age Specific)			
0-9	69	1.8 (1.4-2.3)	23.2%
10-19	33	0.8 (0.6-1.2)	11.1%
20-29	48	1.2 (0.9-1.6)	16.2%
30-49	69	0.9 (0.7-1.2)	23.2%
50-59	28	0.8 (0.5-1.1)	9.4%
60-69	24	1.1 (0.7-1.6)	8.1%
70+	26	1.0 (0.6-1.4)	8.8%

*All rates are age-adjusted unless otherwise noted. Drowning death rate is per 100,000 population. Rates were age-adjusted to the 2000 U.S. Standard population using the direct method. See Technical Appendix for details on how rates were calculated. Source: 2002-2011 Kansas Vital Statistics, Bureau of Epidemiology and Public Health Informatics.

Appendix

Cause Coding:

Hospital discharge data are selected and coded according to the *Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance* from the Safe States Alliance. Injury definitions are based on external cause of injury codes (e-codes) using the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) injury matrix recommended by the Centers for Disease Control and Prevention (CDC)[2]. Emergency department data is coded the same as hospital discharge data but closely follows the selection method from *State Injury Indicators: Instructions for Preparing 2011 Data* from the CDC. Mortality data are coded using the *International Classification of Diseases, 10th Revision* (ICD-10) injury matrix recommended by the CDC[3]. This is similar to the method described in *Instructions for Preparing 2011 Data* but uses a different coding scheme.

Hospital discharge data in this report may not match previously produced estimates. In 2012, the hospital discharge database was updated to remove duplicate records. This may cause a shift in rates and counts. It is recommended not to compare data in this report with previously released estimates for hospital discharge data.

<u>Unintentional Drowning ICD Codes were defined as follows:</u>

ICD-9-CM: E830, E832, E910, any mention of 994.1
ICD-10: W65-W75

Counts:

Counts are the actual number of events that occurred. Counts below five are not displayed in this report.

Rates:

Age-specific rates are calculated by dividing the number of events by the population in that specific age group. By using rates, two differently sized communities/regions can be compared to each other. Note that rates in which the number of events is below 20 are not calculated as rates calculated for numbers less than 20 are scientifically unreliable.

Age-specific rates are calculated by dividing the number of events by the population of Kansas or by the Kansas subpopulation of interest. Population denominators are taken from estimates produced by the U.S. Census Bureau. To be consistent with other KHDE publications, 2000-2009 midyear population estimates produced for each year are used, rather than using the most recent estimate. For example, a 2005 rate will be based on the Kansas population estimate published in 2005 (2005 vintage), rather than using the most recent 2005 population estimate (2009 vintage). For 2001, the 2002 vintage estimates were used. For 2000, the census 2000 populations were used. For 2010, the census 2010 populations were used.

Age adjusted rates:

Age adjustment is a statistical method for standardizing rates for groups that have different underlying age distributions to be more comparable. Age-adjusted rates should be used to compare Kansas with the United States as a whole, or for comparing two groups, or the same group over time, if the underlying population distribution is different or changes (for example, comparing rates for Hispanics and Non-Hispanics). Age-adjusted rates should be understood as relative estimates, not as actual measures of burden, and should not be compared to unadjusted rates.

All age-adjusted rates in this report are computed using the direct method. Briefly, rates are first computed within each age group stratum (i.e. age-specific rates). The products of each age-specific

rate multiplied by the proportion of the 2000 U.S. Standard Population in that age category are then summed across the age group strata. Age-specific rates are based on different age groups across the databases due to differing counts. Some age groups are larger than others to obtain reportable numbers.

Confidence intervals:

All rates presented in this report can be thought of as estimates of a theoretical true value, or population parameter. These estimates are subject to random variation. To characterize this variability, some of the statistics presented in this report include 95 percent confidence intervals. This can be thought of as a range of values that will contain the population parameter (theoretical true value) 95 percent of the time. To compute confidence intervals presented in this report, events were assumed to follow a Poisson distribution[4]. If the number of events was 100 or higher, confidence limits were produced using the normal approximation. If the number of deaths or discharges was fewer than 100, limits are taken directly from the Poisson distribution. Age-adjusted confidence intervals were calculated using the gamma method[5].

Location Coding

The E849 location codes are used to identify where an injury occurred. The place of occurrence describes where the injury happened and not what the patient was doing at the time of the injury.

There are 10 location codes: home, farm, mine and quarry, industrial places and premises, place for recreation and sport, street and highway, public building, residential institution, other specified place, unspecified. In this report, smaller groups were combined to make analysis possible; specifically all groups in the previous sentence except home and place for recreation and sport were combined.

Databases:

The three databases used for the purposes of this document are the hospital discharge database, the emergency department database, and the mortality database. See table below for detailed information on all three databases.

Database	Who's Counted?	Coding System Used	Years Provided In this Report
Emergency Department Database* Kansas Hospital Association**	A person who is admitted for less than 24 hours to a non-federal, short stay community or general hospital who is reporting emergency department visits to Kansas Hospital Association.	ICD-9-CM	2007-2010
Hospital Discharge Database* Kansas Hospital Association**	A person who is admitted for at least 24 hours to a non-federal, short stay community or general hospital who is reporting hospital discharge data to Kansas Hospital Association.	ICD-9-CM	2002-2011
Mortality Database Kansas Department of Health and Environment	Any persons who dies in the state of Kansas, and also Kansans who die outside of the state.	ICD-10	2002-2011

* Unlinked Data: The records in the Kansas emergency department and hospital discharge databases are not unique. Records are not unique when they are unlinked. For example, someone breaks their arm and goes to the emergency department but is then transferred to another emergency department due to a complication. In a linked system this one event can be tied together and counted as one event but with an unlinked system these are counted as two separate events. Serious injuries can inflate the counts if the person is transferred more than once. This is why we refer to events as hospital discharges (not unique).

** Federal and specialty hospitals in Kansas do not report their discharges and emergency department visits to these databases. Not all non-federal, short stay community or general hospitals in Kansas report their emergency department visits or hospital discharge data to Kansas Hospital Association (KHA), therefore their databases do not include 100 percent of emergency department visits and hospital discharges. In 2010, 127 Kansas hospitals reported their hospital discharge data to KHA, 99 Kansas hospitals also reported their emergency department visit data to KHA.

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